

# Pacific Union College

## Major in Biophysics—B.S.

PHYS-02

2007-08

### OCCUPATIONAL INFORMATION

#### General Areas of Service:

The biophysics major provides an excellent pre-professional preparation for medical or dental school and is excellent preparation for graduate training in biophysics, physiology, radiation-biology, and environmental science. With additional professional education courses this broad exposure to physics, biology, chemistry, and mathematics qualifies the biophysics major for teaching at the secondary level.

#### Professional Training:

This program is intended as a preparation for graduate study in a university or professional school rather than an entry-level degree to employment.

#### Denominational Opportunities:

Teaching, health and medical fields.

This program provides the additional emphasis in the physical sciences demanded for graduate study in biophysics, physiology, medicine, radiation biology, and molecular biology, especially when a career in academic medicine or medical research is contemplated. This program is also recommended as a broad major for teaching at the secondary school level.

#### For More Information

Biophysical Society  
9650 Rockville Pike  
Bethesda, MD 20814  
(301) 530-7114  
<http://www.biorphysics.org/>

Department of Physics  
Pacific Union College  
One Angwin Avenue  
Angwin, CA 94508 (707) 965-6684

Counseling & Career Development Center (PUC)

Visit our Web site: <http://www.puc.edu> (Click academics. See appropriate entries under Academic Departments, Academic Programs, and Departmental Home Pages.)

### MAJOR REQUIREMENTS

**Major in Biophysics—B.S.** A minimum of 60 hours (21 in the upper division) including the following:

|  |                            |   |
|--|----------------------------|---|
| BIOL 111-2-3   | Biological Foundations     | 5-5-5   |
| BIOL 320   | Cell and Molecular Biology | 4   |
| BIOL 348   | Systems Physiology         | 5   |
| PHYS 211-2-3   | Physics                    | 4-4-4   |
| PHYS 314   | Elementary Modern Physics  | 4   |
| PHYS 321-322   | Biophysics                 | 3-3   |
| PHYS 396   | Seminar (4 quarters)       | $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ - $\frac{1}{2}$ |
| Upper division physics electives: (include at least one lab) |                            | 4   |
| or CHEM 344, 344L Nuclear Phys. and Chem./Lab (3/1)          |                            |   |
| or CHEM 451, 451L Physical Chem./Laboratory (3/1)            |                            |   |

*Additional major electives: Choose from physics, biology the preceding chemistry courses, and the following:* 8  
CHEM 452 Physical Chemistry (3)

#### Recommended Courses:

|           |                          |
|-----------|--------------------------|
| MICR 134  | General Microbiology (5) |
| PHYS 256  | Optics (4)               |
| PHYS 389L | Experimental Physics (3) |

#### Required Cognate Courses:

|              |                    |       |
|--------------|--------------------|-------|
| CHEM 111-2-3 | General Chemistry  | 5-5-5 |
| CHEM 371-2-3 | Organic Chemistry  | 4-4-4 |
| CHEM 381     | Biochemistry I     | 4     |
| ENGR 216     | Circuit Theory     | 4     |
| MATH 131-2-3 | Calculus* I-II-III | 4-4-4 |

#### Recommended Cognate Course:

|          |                                   |
|----------|-----------------------------------|
| CPTR 115 | Intro to Computer Programming (4) |
|----------|-----------------------------------|

#### Footnotes:

\*This major fulfills the following general education requirements:

1. Philosophy: If PHYS 390 is chosen
2. Introductory-level mathematics and science
4. Scientific Inquiry: BIOL-PHYS-CHEM courses
5. Insight Through Investigation: BIOL-PHYS-CHEM
4. Two hours of religion if PHYS 485 is chosen
5. Information Management: CPTR 115

## SUMMARY OF GENERAL EDUCATION

*Note: The following is a brief summary of General Education requirements. For more info, please refer to the PUC Catalog.*

### Foundations of Learning

ENGL 101-102 College English (4-4)  
 Speech course: To be chosen from list (3)  
 STAT 222 Introduction to Statistics (4)

### Human Identity in Cultural Contexts

HIST 101-102 History of World Civilizations  
*or HIST 134-135 (4-4)*  
 Philosophy course: To be chosen from list (3)  
 Two social sciences courses: To be chosen from list (7)  
 Foreign Language: Intermediate-level or option  
 (BS does not require a foreign language study)

### Insights of the Imagination

Literature: ENGL 301 Great Books (4)  
 Art history course: To be chosen from list (3)  
 Music history course: To be chosen from list (3)

### The Natural World: College-level

Scientific Inquiry: Fulfilled by major  
 Laboratory science course: Fulfilled by major  
 Science, Technology, and Culture: To be chosen from list (3)

### Revelation, Belief, and Action

Sixteen to eighteen quarter hours distributed as follows:  
 Minimum: 6 hours of courses with RELB prefixes  
 Maximum: 9 hours of lower division will apply  
*For transfer students from public colleges, this requirement is prorated: Sophomores—14, Juniors—10, Seniors—6*

### Health and Fitness

One health course: To be chosen from list (2)  
 Four ESAC courses including one aerobics (4)  
 Transfer students: One for each year in residence at PUC

### Skills for Daily Living

Select 4 units from 2 or more categories. To be chosen from list (4)

## SAMPLE FOUR-YEAR PROGRAM

*This sample curriculum is designed to show you how a program may be constructed and to help you select a proper sequence of courses in the major. It is not likely that these courses can always be taken in the order given. Your advisor will help you design a personalized program of studies.*

| First Year                          | A         | W         | S         |
|-------------------------------------|-----------|-----------|-----------|
| Computer Programming                | 4         | -         | -         |
| General Chemistry                   | 5         | 5         | 5         |
| Calculus I-II-III                   | 4         | 4         | 4         |
| College English                     | -         | 4         | 4         |
| General Education/Electives*        | <u>3</u>  | <u>3</u>  | <u>3</u>  |
|                                     | 16        | 16        | 16        |
| Second Year                         | A         | W         | S         |
| Physics with Calculus               | 4         | 4         | 4         |
| Biological Foundation               | 5         | 5         | 5         |
| Organic Chemistry                   | 4         | 4         | 4         |
| General Education/Electives*        | <u>3</u>  | <u>3</u>  | <u>3</u>  |
|                                     | 16        | 16        | 16        |
| Third and Fourth Years              | A         | W         | S         |
| Elementary Modern Physics           | 4         | -         | -         |
| Circuit Theory                      | -         | -         | 4         |
| Cell & Molecular Biology            | -         | 4         | -         |
| Biochemistry I                      | 4         | -         | -         |
| Biophysics (offered odd years only) | -         | 3         | 3         |
| Systems Physiology                  | 5         | -         | -         |
| Upper division physics electives**  | 4         | -         | -         |
| Additional major electives**        | -         | 4         | 4         |
| Physics Seminar (4 quarters)        | -         | 1         | 1         |
| Additional Cognates (Set 1 or 2)    | 4         | 4         | 8         |
| General Education/Electives*        | <u>11</u> | <u>16</u> | <u>12</u> |
|                                     | 32        | 32        | 32        |

\*See "Summary of General Education" above.

\*\* See *Catalog* for choices.

### How to Construct Your Own Program

1. Counsel with your advisor.
2. Consider your aptitudes, interests, and available courses.
3. Schedule major courses and cognates first.
4. Fill the rest of your schedule with G.E. requirements.
5. For the freshman year include English, religion, and PE courses.

### What the Degree Includes

- A total of 192 quarter units including:
1. A minimum of 60 upper division units.
  2. General Education requirements.
  3. Major requirements.
  4. Minimum 2.0 GPA, overall and major.